CE-212
FILE 641.1

JAN 21 1963

Model 65-90T

Beech Aircraft Corporation
Wichita 1,
Kansas

Attention: Mr. Chester A. Rembleske
Chief, Administrative Engineer

Gentlemen:

Enclosed is one copy of the Airframe and Equipment Section's Special Conditions for the Beech Model 65-90T. These conditions together with CAR 3 dated May 15, 1962, plus Amendments 3-1 and 3-2 will provide, in its respective area, a level of safety equivalent to the Model 65-80.

It is our understanding from your November 13, 1962 letter (ref 9011-90) and subsequent visits and telephone conversations among Beech and FAA personnel that you are generally in agreement with these conditions.

Rather than delay until the Special Conditions for all sections have been resolved, it is believed desirable to notify you as each section finalizes its Special Conditions. Accordingly, you will be notified when the Propulsion Section and the Flight Test Section completes their Special Conditions.

Sincerely,

Original signed by
Walter J. O'Toole

Walter J. O'Toole
Chief, Engineering and
Manufacturing Branch

Enclosure

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cc: FS-120
CE-218(2)
Designee

INITIALS	RTG. SYM.	DATE	INITIALS	RTG. SYM.	DATE
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Form FAA-1868 (7-47) ☆ GPO 1961-601306 FEDERAL AVIATION AGENCY

~~Proposed~~

SPECIAL CONDITIONS FOR BEECH 65-90T

by CE-212

December 5, 1962

In addition to CAR 3 dated May 15, 1956 and Amendments 3-1, 3-2, and 3-6, the following Special Conditions are applicable:

CAR Ref.	
3.195(a) (3)	The engine mounts and supporting structure shall be designed for the limit torque corresponding with take-off power and propeller speed multiplied by a factor of 1.6 acting simultaneously with 1G flight loads.
3.195(b)	The limit torque for turbine engines is the mean torque multiplied by a factor of 1.25.
3.198	The engine mounts and supporting structure shall be designed for the loads resulting from the conditions prescribed in either paragraph (a) or paragraph (b) of this section, taking into account gyroscopic effects with the engines at maximum continuous rpm: (a) The maneuvers prescribed in paragraphs 3.191(b) and 3.216. (b) All combinations of the following: (1) A yaw velocity of 2.5 radians per second; (2) A pitch velocity of 1.0 radian per second; (3) A normal load factor 2.5; (4) Maximum continuous thrust.
3.199(a)	The airplane shall be designed for the limit loads resulting from fuel flow interruption to the critical engine at all speeds between V_{MC} and V_D and for the limit loads resulting from the pilot's probable corrective action. Pilot corrective action shall be assumed to occur not earlier than two seconds after engine failure. The magnitude of the corrective action may be based on the control forces specified in CAR 3.212 except that lower forces may be assumed if it is shown by analysis or tests that such forces will control the yaw and roll resulting from the prescribed engine failure.
3.245(b) (3)	The engine supporting structure, the wing, and the wing to fuselage attaching structure shall be designed for the dynamic landing loads resulting from the nacelle in the two wheel level landing condition of CAR 3.245(b) (2).

Car Ref.

3.311(d) Propeller Precessional Modes shall be evaluated to the degree necessary to assure stability. The evaluation shall include variations in the essential input parameters such as inertia, stiffness, damping or equivalent functions.

PROPOSED METHOD OF COMPLYING WITH PARAGRAPH 3.311(d)
FOR THE BEECH MODEL 65-90T

The following is the method which will be employed by the Beech Aircraft Company in fulfilling the requirements of Paragraph 3.11(d):

1. Run a two degree of freedom (pitch and yaw) NASA-Type Whirl-Mode Analysis, including variations in inertia, stiffness, damping or equivalent functions.

2. Supplement this by experimental stiffness measurements of the propeller-engine system on the flight airplane.

3. Compare the stability level of the indicated whirl-modes and their precession frequencies with the wing bending modes to see that there is adequate separation of frequencies. It is proposed to alter design features if necessary rather than enter into a complex flutter analysis which combines propeller whirl mode with wing flutter modes.

4. Wing flutter will be investigated independently of propeller whirl.